

00311 C L A I M S

00312

00313 1. Preferably co-extruded multi-layer structure, especia-
00314 lly multi-layer film structure, with a first and a
00315 second outer layer and a third inner layer between the
00316 first and second layer, all layers consisting essential-
00317 ly of polystyrene, whereby the overall thickness is in
00318 the range of 0,5 to at least 4 mils (0,012 to 0,102 mm
00319 or more) and the first and second layer do consist of
00320 general purpose styrenic resin whereas the third layer
00321 does consist of a modified tough polystyrene with modi-
00322 fiers such as butadiene and/or acrylat and/or similar
00323 modifiers, and with such an amount of those modifiers,
00324 that the third layer may function as a carrier layer for
00325 the first and second layer, in terms of allowing to
00326 produce the label-structure according to the coextrusion
00327 process.

00328

00329 2. Film structure according to claim 1, characterized by
00330 a shrinkability in extrusion direction.

00331

00332 3. Structure according to one or more of the proceeding
00333 claims or especially to one of them, characterized in
00334 that the third layer is pigmented.

00335

00336 4. Structure according to one or more of the proceeding
00337 claims or especially to one of them, characterized in
00338 that the third layer is voided.

00339

00340 5. Structure according to one or more of the proceeding
00341 claims or especially to one of them, characterized in
00342 that the third layer is foamed.

00343

00344 6. Structure according to one or more of the proceeding
00345 claims or especially to one of them, characterized in

00346 that the first and second layers do provide ca. 25 to .
00347 ca. 75 % of the overall weight/thickness.

00348

00349 7. Structure according to one or more of the proceeding
00350 claims or especially to one of them, characterized in
00351 that the first and second layer do provide ca. 50 to ca.
00352 75 % of the overall weight/thickness and that the third
00353 layer is transparent.

00354

00355 8. Structure according to one or more of the proceeding
00356 claims or especially to one of them, characterized in
00357 that the first and the second layer do provide ca. 25 to
00358 ca. 50 % of the overall weight/thickness and that the
00359 third layer is opaque.

00360

00361 9. Structure according to one or more of the proceeding
00362 claims or especially to one of them, characterized in
00363 that the shrinkability is almost only present in ex-
00364 trusion direction.

00365

00366 10. Multi-layer film structure, especially multi-layer
00367 film label structure, having a shrinkability in ex-
00368 trusion direction, produced in the coextrusion process,
00369 with a first and a second outer layer and a third inner
00370 layer between the first and second layer, all layers
00371 consisting essentially of polystyrene, characterized in
00372 that the first and second layer are by weight approxima-
00373 tely 50-75% of the overall weight of the label-struct-
00374 ure, that the overall thickness is in the range of 0,5
00375 to at least 4 mils (0,012 to 0,102 mm) and that the
00376 first and second layer consist of general purpose styre-
00377 nic resin, whereas the third layer is a modified tough
00378 polystyrene, such as "K-resin" of Philipps Petroleum
00379 Chemicals.

00380

00381 11. Multi-layer film structure according to claim 10,
00382 characterized in that the shrinkability is present only
00383 in extrusion direction.

00384

00385 12. Multi-layer film structure, especially multi-layer
00386 film label-structure, produced preferably in the coextru-
00387 sion process, with a first and second outer layer and a
00388 third inner layer between the first and second layer,
00389 all layers consisting essentially of general purpose
00390 styrenic resin, characterized in that the first and
00391 second layer are by weight approximately 25-50% of the
00392 overall weight of the structure, that the overall thick-
00393 ness of the structure is in the range of 0,5 to at
00394 least 4 mils (0,012 to 0,102 mm or more), that the first
00395 and second layer do consist of general purpose styrenic
00396 resin, whereas the third layer is a modified tough po-
00397 lystyrene such as "K-resin" of Philipps Petroleum Chemi-
00398 cals, and that the third layer is foamed, voided or
00399 pigmented in order to give the structure opaque pro-
00400 perties.

00401

00402 13. Multi-layer film structure according to claim 11,
00403 characterized by a shrinkability in extrusion direction.

00404

00405 14. Multi-layer film structure according to claim 12 or
00406 13, characterized in that a further inner layer (fourth
00407 layer) is provided and that the fourth layer does
00408 consist of recycled material.

00409

00410 15. Multi-layer film structure according to one of the
00411 claims 12 to 14, characterized in that the shrinkability
00412 is almost only in extrusion direction.

00413

00414 16. Method for producing a polystyrene based multi-layer
00415 structure, with a middle layer (third layer) of tough

00416 polystyrene, having additives such as butadiene and/or
00417 acrylat or consisting of so called "K-resin", charact-
00418 erized in that in a first step one or two outer layers
00419 are put on the middle layer preferably by coextrusion,
00420 such outer layers consisting of general purpose styrenic
00421 resin, and that the so built structure will be in a
00422 second step blown up preferably in a bubble blowing
00423 process whereby the middle layer functions as a carrier
00424 in term of toughness for the outer layers.

00425

00426 17. Method according to claim 16, characterized by a
00427 shrinkability only in extrusion direction.

00428

00429 18. Container, such as glass container, plastic contain-
00430 er, metal container, labeled with a multi-layer label-
00431 structure having one or more of the features mentioned
00432 for the structure in one or more of the preceding claims
00433 or produced according to the claimed method.